“How the variables of background and education change students’ responses to the effect of farming and husbandry practices on animal welfare”

Undergraduate Honors Thesis

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By

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Abstract

Assessment of Student Attitudes About Companion and Food Animal Welfare. J. Bennett[1], J. Osborne[1], K. Fike[1], K. Hoblet[1], J. Kinder[1], and P. Hemsworth[2], [1]Ohio State University (OSU), Columbus, OH, [2]Animal Welfare Centre, Victoria, Australia.

We were interested in assessing student attitudes toward animal welfare as part of a larger project involving development and incorporation of animal welfare teaching modules into the Animal Sciences curriculum at OSU. The specific objective was to assess how type of animal experience and course level affected student perceptions about animal welfare in various production settings and when typical animal husbandry practices are used. Animal sciences students (n=180) from Introductory and Capstone courses in Animal Sciences were surveyed as to their level of agreement (strongly agree=1) or disagreement (strongly disagree=5) about whether animal husbandry practices seriously reduce animal welfare. Survey responses were categorized by type of animal experience (small companion animals only =SMO; food animals only =FO; small companion animals and horse =S&H; small companion animal and food animal =S&F; small companion animals, horse, and food animals=ALL). Across most questions, students with some food animal experience were less concerned that animal husbandry practices would seriously reduce animal welfare. For example, students in the SMO (2.74±0.19) and S&H (3.22±0.21) groups more strongly agreed ($P < .01$) that trimming hen's beaks seriously reduces animal welfare as compared with students in the S&F (3.64±0.13) and ALL (3.48±0.19) groups. Students in the introductory course (3.63±0.21) were more ($P < .001$) concerned that castration seriously reduces animal welfare as compared with students in the Capstone course (4.23±0.18). We conclude

that type of animal experience influences student perceptions about effects of husbandry practices on animal welfare.

"How the variables of background and education change students' responses to the effect of farming and husbandry practices on animal welfare"

The general public's concern for the welfare of animals in the areas of private homes, research, and production industries has increased greatly in the last few years. People are demanding accountability for treatment of animals and the government is sensitive to these opinions (Public). Laws and regulations are being implemented to ensure consideration for the welfare of animals. The content of these laws and regulations can be based on two factors: emotion or scientific evidence. Basing decisions on emotion, while not guaranteeing better animal welfare, could lead to strict regulation and disastrous loss of profit for the animal production industry. For this reason, it is imperative for the agricultural and research communities to establish scientific methods of measuring animal welfare so that decisions regarding animal welfare can be made in an objective scientific manner (Cheeke, 352). To be beneficial, this knowledge must be made available to those working in the industry (United).

The Departments of Animal Sciences and Colleges of Veterinary Medicine at The Ohio State University recognize the importance animal welfare plays in food animal agriculture and have obtained a grant to develop animal welfare teaching modules. The departments will incorporate these modules into the existing curriculum over the course of three years. Through a total of nine teaching modules, students will obtain current, science-based information relative to animal welfare. This grant's objective is to prepare students entering the food animal industry to confidently address public sentiment about

animal welfare issues and make knowledgeable management choices, maximizing production efficiency and responsible animal welfare practices.

Problem Identification/Justification

This research also represents an opportunity for educational institutions, Animal Sciences Departments specifically, to better tailor an educational series to correct common misconceptions on animal welfare issues in the Agricultural Industry. This honors project would contribute to the development of animal welfare teaching modules currently being developed by The Ohio State University's Animal Sciences Department in conjunction with the College of Veterinary Medicine.

The purpose of this study was to assess Animal Sciences student's attitudes and perceptions of common farming and husbandry practices before the implementation of the animal welfare modules, specifically focusing on the independent variables of the students' backgrounds and educational levels. The collection of data used in this study, labeled Year 1, was the base sample, and will be used in later comparisons with future questionnaire data sets in various stages of the teaching modules implementation. The Year 1 data will be used to gauge the impact and success of the teaching modules. The responses of the students can be attributed toward their attitudes as defined in Fishbein's Readings in Attitude Theory and Measurement. "An attitude is a mental and neutral state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Fishbein, 7). The conclusion from this definition is that the attitudes (or perceptions) the students have towards the listed farming and husbandry practices were

based on the values and experiences in the setting where they developed sociologically. Students who have been exposed to production practices through family background or education have a wider base knowledge of the reasons behind these practices. Those students without experience in these farming and husbandry practices will not have as much knowledge about the reasoning behind such practices.

Hypothesis

For these reasons, I hypothesize that students with no background experience with food animals will be more likely to agree that the listed farming and husbandry practices seriously reduce the welfare of animals. In contrast, I hypothesize those students with food animal experience will more likely disagree that most of farming and husbandry practices listed seriously reduce the welfare of animals. In the education comparison, I hypothesize that students in the entry level course (AS 200) are more likely to agree that the listed farming and husbandry practices seriously reduce the welfare of the animals than the students in the senior capstone course (AS 600). It is the experience with farm animals, regardless of whether it comes through life experiences or the classroom that is the hypothesized key to students' perceptions of how certain husbandry practices affect animal welfare. This theory is supported by Peter Cheeke's observation that in separating farming practices from the majority of society, a gap develops between the ideals of the general public and agriculturalists. This gap perpetuates into animal activism by people who have no understanding or experience of the animals they seek to protect (Cheeke, 348)

Procedure & Methodology

Participants

The participants in this study were Animal Sciences students enrolled in the Animal Sciences courses 200 and 600 at The Ohio State University during the Fall 2002- Summer 2003 school year. There were a total of 180 students who participated in the study. Informed consent and permission to use human participants was granted as part of the larger educational model grant obtained by The Ohio State University Department of Animal Sciences and College of Veterinary Medicine. The students in the course Animal Sciences 200: Introduction to Animal Sciences were of a lesser educational level (rank 1 and 2) than those in the course Animal Sciences 600: Capstone (rank 4).

Apparatus

This honors project used questionnaires completed by students in the two Animal Sciences 200 and 600 classes. Only questionnaires of students majoring in Animal Sciences will be used in the comparison to reduce confounding data. The questionnaires were produced as part of the Animal Welfare Grant, the Department of Animal Sciences and the College of Veterinary Medicine at The Ohio State University. These questionnaires were developed to evaluate the effectiveness of their teaching modules. The data set of this study consists of the questionnaires collected from the students in five required animal sciences courses over four quarters (fall 2002- summer 2003) and is titled “Year 1”. The questionnaire has a total of 15 questions to evaluate the students’ perceptions of current animal welfare issues.

Design

This honors project centers around two questions in the questionnaire: 14 (Do you agree that the following farming practices seriously reduce the welfare of animals?) and 15 (Do you agree that the following husbandry practices seriously reduce the welfare of animals?). The dependent variables in this project were the students' answers to the questionnaire. The responses of the students were based on a scale ranked 1 to 5. A response of 1 represented "agree very strongly" and a response of 5 indicated "disagree very strongly". The farming and husbandry practices of interest are presented in Table 1.

Table 1

Q 14: Farming Practices	Q 15: Husbandry Practices
Sows in stalls/crates	Castration of lams, pigs, calves, horses
Laying hens in cages	Tail docking of calves
Laying hens in free-range conditions	Tail docking of lambs
Cattle in feedlots	Tail docking of dogs
Dairy cows in stalls	Trimming hen's beaks
Cattle on pasture	Electric training collars for dogs
	De-clawing of cats
	Forced molting of hens
	Racing 2-year old horses

The independent variables of interest in this study are the educational level and background of the students. The students' education level is simply indicated by the course in which they were enrolled. The questionnaires from Animal Sciences 200 indicated a lesser educational level (majority of those enrolled were rank 1 or 2). In contrast, the questionnaires from Animal Sciences 600 indicated a greater educational level (all those enrolled were rank 4).

Background experience with animals was determined using the open-end-responses on the fourth page of the questionnaire. The students were placed in one of the five classes of backgrounds shown in Table 2 with the Background Codes shown in parenthesis. The background classes of 'no experience' and 'just food animal experience' were not used in analysis because the few number of students in these categories does not make a representative sample.

Table 2

Background Classes (Type of Animal Experience)	Number of Students in Each Group
(0) No experience with any types of animals	1
(1) Just small companion animal experience (SMO)	42
(2) Just food animal experience	3
(3) Small companion animal & food animal experience (S&F)	71
(4) Small companion animal & horse experience (S&H)	30
(5) Small companion animal, food animal, & horse experience (ALL)	34

Procedure

The data set was analyzed using a linear statistical analysis in the computer program SAS. The level of significance (p-value) was set at 0.05. For Animal Sciences 200 as compared with 600, the educational level, background experience with animals, and the interaction of educational level and background were analyzed.

Results

The statistical analysis results regarding the significance of Background Effect, Course Effect, and Background x Course Interaction on students responses to questions 14 and 15 in the animal welfare questionnaire are displayed in Table 3.

Background Effect

There was a significant background effect on the students' responses to the question "Do you agree that the following farming practices seriously reduce the welfare of animals" (1 = 'agree very strongly' and 5 = 'disagree very strongly') with regard to sows in stalls/crates (P= 0.0152); laying hens in cages (P= 0.0018); laying hens in free-range conditions (P= 0.0353); dairy cows in stalls (P= 0.0094); cattle on pasture (P= 0.0918). In addition, there was a significant background effect on the students responses to the question "Do you agree that the following husbandry practices seriously reduce the welfare of animals" (1 = 'agree very strongly' and 5 = 'disagree very strongly') with regard to castration of lambs, pigs, calves, horses (P= 0.0004); tail docking of calves (P= 0.0151); tail docking of lambs (P< 0.0001); trimming hen's beaks (P= 0.0049); and electric training collars for dogs (P=0.0023).

In comparing the different background groups, a p-value of less than 0.05 was considered significant. The p-values for comparing the responses of different background groups (for questions in which a total background effect was significant) are included in Table 4. The least squares mean responses of the different background groups are presented in Table 5 and graphically depicted in Figures 1 and 2. The background groups that differed significantly in their responses to each of the farming/ husbandry practices mentioned above are as follows.

1 Sows in stalls/crates: SMO vs. S&F; SMO vs. ALL; S&H vs. S&F; S&H vs. ALL
2 Laying hens in cages: SMO vs. S&F; SMO vs. ALL; S&H vs. S&F; S&H vs. ALL
3 Laying hens in free-range conditions: SMO vs. S&F; SMO vs. ALL
4 Dairy Cows in Stalls: SMO vs. S&F; SMO vs. ALL; S&H vs. S&F
5 Cattle on Pasture: S&H vs. S&F; S&H vs. ALL
6 Castration of lambs, pigs, calves, horses: SMO vs. S&F; SMO vs. ALL; S&H vs. S&F; S&H vs. ALL
7 Tail docking of calves: SMO vs. S&F; SMO vs. ALL
8 Tail docking of lambs: SMO vs. S&F; SMO vs. ALL; S&H vs. S&F; S&H vs. ALL
9 Trimming hen's beaks: SMO vs. S&F; SMO vs. ALL
10 Electric training collars for dogs: SMO vs. S&F; SMO vs. S&H; SMO vs. ALL

Course Effect

There was a significant course effect on students' responses regarding the welfare implications of farming-husbandry practices for Cattle on Pasture (P= 0.0265) and Castration of lambs, pigs, calves, and horses (P= 0.0204). The response means of the students in the 200 level (n = 117) versus the response means of the students in the 600 level class (n= 63) are depicted in Figure 3. The students in the 200 level class were significantly more concerned that the farming practices of cattle on pasture (least square mean =3.67) and castration of lambs, pigs, calves, and horses (least square mean = 3.63) reduced the animals welfare than the students in the 600 level course (with least square means of 4.40 and 4.23 respectively).

Background x Course Interaction Effect

There was a background x course interaction in the students' responses to the farming practices of Cattle in feedlots (P= 0.0074).

No Significant Effects

There was no significant difference in the students' responses to the extent in which the following husbandry practices reduce the welfare of the animals involved: tail docking of dogs, de-clawing of cats, forced molting of hens, and racing 2 year old

horses due to background, course, or background x course interaction (Overall P-value >0.05). On a scale from 1 to 5 with (1 = agreeing strongly the practice reduces the animals' welfare and 5 = disagreeing strongly the practice reduces the animals' welfare), the mean responses to the practices mentioned above are tail docking on dogs = 3.217, de-clawing cats = 3.367, forced molting on hens = 2.978, and racing 2 year old horses = 3.222.

Discussion

For the questions that had a significant background effect, the background group of SMO (small companion animal only) was significantly more concerned that the farming-husbandry practices assessed (with the exception of 'Cattle on Pasture') seriously reduced the welfare of animals than the groups of S&F (small companion animal & food) and ALL (small companion animal, food, and horses) ($P < 0.05$). There was no significant difference between the responses of students with a SMO (small companion animal only) background compared with students with a S&H (small companion animal & horse) background in all of the farming practices in question with the exception of the questions regarding electric training collars for dogs (15F). Having experience with food animals seemed to be the main factor in causing significantly differing opinions.

The statistical analysis suggested that having experience with horses in addition to small animals decreased the concern of students regarding the harmful effects of about half of the farming/ husbandry practices. When experience with horses was added to small companion animal experience making up the S&H background category, the students' average responses for four of the farming practices increased. This

indicates that the additional horse experience decreased the students concerns that the farming practices of 'laying hens in free-range conditions'; 'tail docking of calves'; 'trimming hen's beaks'; and 'electric training collars for dogs' reduced the welfare of the animals involved. Interestingly, the S&H (small companion animal & horse) group was significantly more concerned about the farming practice of cattle on pasture than the S&F (small companion animal & food animal) or ALL (small companion animal, food animal, and horses) groups.

The effect of educational level on students' responses was less than expected. For most of the farming/ husbandry practices there was not a significant course effect. Only Q14F: Cattle on Pasture and Q15A: Castration of lambs, pigs, calves, horses showed a significant course effect. In both farming practices, animal sciences students in the 200 level course were significantly more concerned than the students in the 600 level course. This may indicate the current curriculum of the Animal Sciences major at OSU addressed the concerns that students had in these two farming practices thereby alleviating them. The course effect is a special area of interest for the larger grant of which this honors project is part. After the animal welfare modules are incorporated into the Animal Sciences curriculum, it is expected that the effects of educational level on students' responses will increase.

The husbandry practices that showed neither background effect, course effect, or background x course interaction were de-clawing of cats; racing of 2 year old horses; tail docking of dogs; and forced molting of hens. The reason for the first three practices to be placed in this category could be attributed to their common, widespread nature. The placement of 'Forced molting of hens' into this category is unknown, but could be

because many students were unaware of what this practice actually entails. In response to this possibility, the questionnaire for later years is to be modified to include a 'not enough information known' option for students to check in addition to the five concern levels.

Table 3.

Overall P-values & Variables of Interests for Farming Practices					
Question Code	**Farming Practice in Question**	**P-value**	**Background Effect**	**Course Effect**	**B x C Interaction**
14A	Sows in stalls/crates	0.0307	0.0152	0.5722	0.4277
14B	Laying hens in cages	0.0036	0.0018	0.7621	0.2988
14C	Laying hens in free-range conditions	0.0293	0.0353	0.1674	0.7475
14D	Cattle in feedlots	0.0004	0.0074	0.1165	0.0074
14E	Dairy cows in stalls	0.0097	0.0094	0.6714	0.2965
14F	Cattle on pasture	0.0001	0.0198	0.0265	0.1530
15A	Castration of lambs, pigs, calves, horses	<0.0001	0.0004	0.0204	0.4738
15B	Tail docking of calves	0.0206	0.0151	0.2661	0.3907
15C	Tail docking of lambs	<0.0001	<0.0001	0.2803	0.5310
15D	Tail docking of dogs	0.1394	0.0199	0.7864	0.5969
15E	Trimming hen's beaks	0.0087	0.0049	0.4103	0.4764
15F	Electric training collars for dogs	0.0004	0.0023	0.1833	0.1248
15G	De-clawing of cats	0.1357	0.1178	0.7754	0.6718
15H	Forced molting of hens	0.7079	0.2859	0.3932	0.7969
15I	Racing 2yr old horses	0.1640	0.2090	0.2854	0.8291

Table 4

P-values of Background Interactions								
Question Code	Farming Practice in Question	P-value	Background Effect	SMO vs S&F	SMO vs S&H	S&F vs S&H	S&F vs ALL	S&H vs ALL
14A	Sows in stalls/crates	0.0307	0.0152	0.0077	0.9942	0.0221	0.9547	0.0258
14B	Laying hens in cages	0.0036	0.0018	0.0006	0.8319	0.0179	0.4319	0.0356
14C	Laying hens in free-range conditions	0.0293	0.0353	0.0158	0.2009	0.0109	0.6013	0.2296
14E	Dairy cows in stalls	0.0097	0.0094	0.0004	0.1495	0.0246	0.2858	0.4828
14F	Cattle on pasture	0.0001	0.0198	0.1743	0.1186	0.2249	0.9743	0.0059
15A	Castration of lambs, pigs, calves, horse	<0.0001	0.0004	0.0011	0.8028	0.006	0.9013	0.0034
15B	Tail docking of calves	0.0206	0.0151	0.0012	0.3008	0.0368	0.3717	0.3247
15C	Tail docking of lambs	<0.0001	<0.0001	<0.0001	0.4217	0.0002	0.612	0.0043
15E	Trimming hen's beaks	0.0087	0.0049	0.0002	0.0924	0.0068	0.4864	0.3647
15F	Electric training collars for dogs	0.0004	0.0023	<0.0001	0.0262	0.042	0.0766	0.7772

Table 5

Least Squares Means for Responses Within Groups						
Question Code	Farming Practice in Question	Background Effect	SMO LSMean	S&F LSMean	S&H LSMean	All LSMean
15C	Tail docking of lambs	0.0001	2.89^{a}	4.05^{b}	3.12^{a}	3.93^{b}
15B	Tail docking of calves	0.0151	2.81^{a}	3.63^{b}	3.12^{ab}	3.41^{b}
15E	Trimming hen's beaks	0.0049	2.74^{a}	3.64^{b}	3.22^{ab}	3.48^{b}
15F	Electric training collars for dogs	0.0023	2.53^{a}	3.55^{b}	3.2^{b}	3.12^{b}
14F	Cattle on pasture	0.0198	3.86^{ab}	4.21^{b}	3.38^{a}	4.21^{b}
14E	Dairy cows in stalls	0.0094	2.66^{a}	3.52^{b}	3.07^{ac}	3.27^{c}
14A	Sows in stalls/crates	0.0152	2.64^{a}	3.32^{b}	2.65^{a}	3.31^{b}
14C	Laying hens in free-range conditions	0.0353	3.03^{a}	3.6^{b}	3.39^{ab}	3.72^{b}
15G	De-clawing of cats (P=0.1357)	N/A	3.00	3.71	3.27	3.35
15I	Racing 2yr old horses (P=0.1640)	N/A	3.13	3.54	3.19	2.99
15H	Forced molting of hens (P=0.7079)	N/A	2.63	3.06	3.14	2.98
15D	Tail docking of dogs (P=0.1394)	N/A	2.67	3.53	3.09	3.31

*Different Superscripts indicate a significant difference in responses

Figure 1

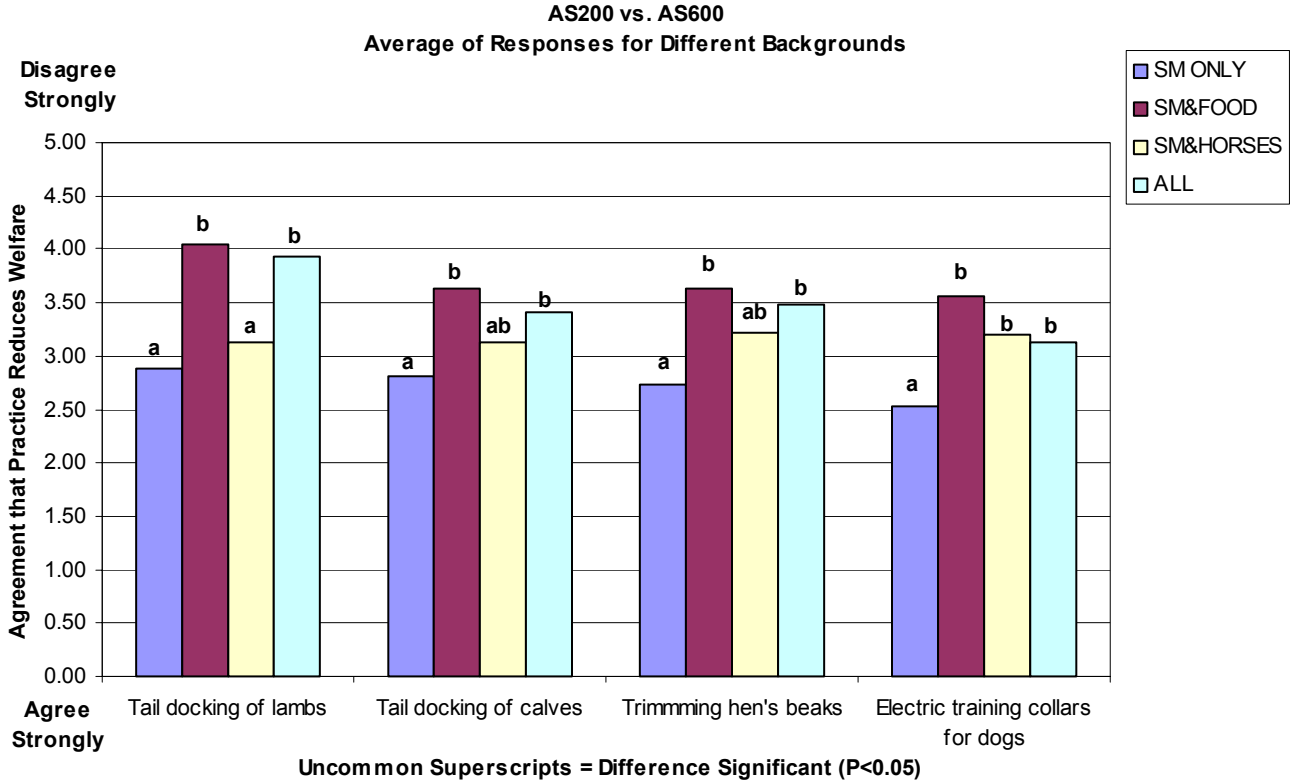
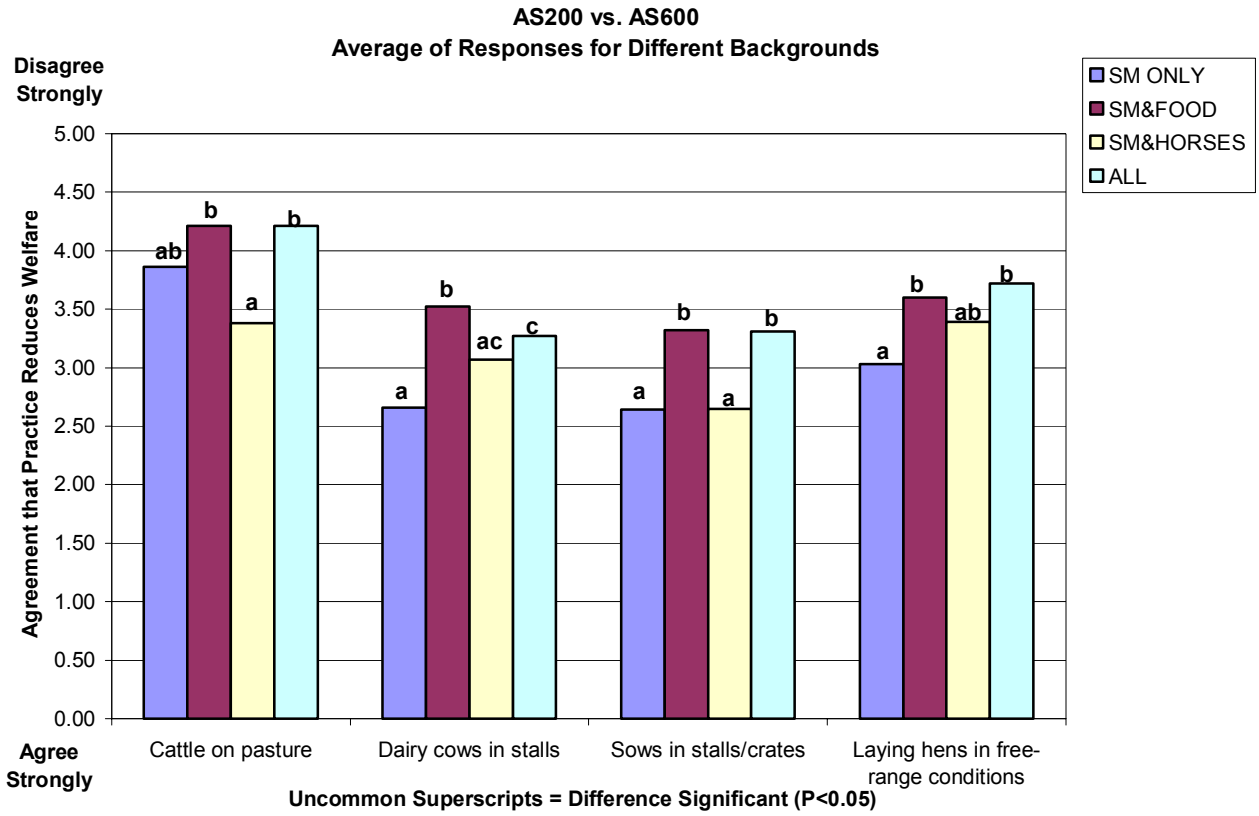

AS200 vs. AS600
Average of Responses for Different Backgrounds
Disagree Strongly
Agree Strongly
Agreement that Practice Reduces Welfare
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
SM ONLY
SM&FOOD
SM&HORSES
ALL
a
b
a
b
a
b
ab
b
a
b
ab
b
a
b
b
b
Tail docking of lambs
Tail docking of calves
Trimmming hen's beaks
Electric training collars for dogs
Uncommon Superscripts = Difference Significant (P<0.05)

Figure2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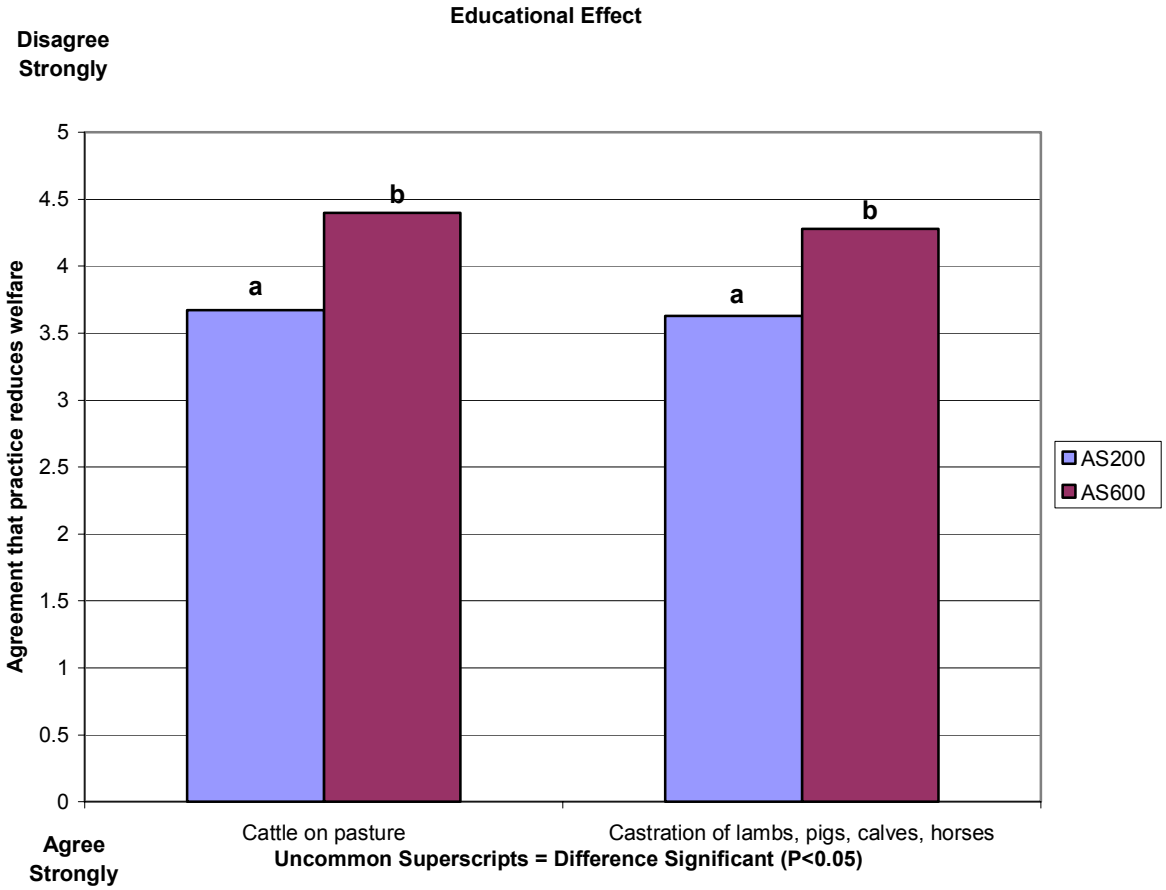
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
SM ONLY
SM&FOOD
SM&HORSES
ALL
ab
b
a
b
a
b
ac
c
a
b
a
b
a
b
ab
b
Cattle on pasture
Dairy cows in stalls
Sows in stalls/crates
Laying hens in free-range conditions
Uncommon Superscripts = Difference Significant (P<0.05)

Figure 3


Educational Effect
Disagree Strongly
Agree Strongly
Agreement that practice reduces welfare
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
a
b
a
b
Cattle on pasture
Castration of lambs, pigs, calves, horses
AS200
AS600
Uncommon Superscripts = Difference Significant (P<0.05)

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Appendix